

IN THE CLAIMS

Please amend Claims 1-7, 10, 11, 13, and 16-19 as follows:

1. (Currently Amended) An information processing device for aiding control operations relating to controlling the position and orientation of a virtual object positioned in three-dimensional space, said device comprising:

image-taking means for taking images in real space in order to display the virtual object in a superimposed manner on real space;

~~synthesizing~~ superimposing means for superimposing ~~synthesizing a~~ the virtual object with the taken image;

~~operating means for controlling the position and orientation of the virtual object; and~~

inputting means for obtaining three-dimensional position information of a plurality of positions inputted by a user in real space;

~~aiding~~ setting means for ~~obtaining a three-dimensional position of real space from external instructions; and obtaining~~ setting a constraining shape based on the obtained three-dimensional position information for aiding in control operations for the position and orientation of the virtual object; ~~and~~

operating means for performing an operation controlling the position and the orientation of the virtual object based on the constraining shape in accordance with the user's instructions ~~wherein the position and orientation of the virtual object are controlled by instructions from said operating means, based on constraint conditions based on the constraining shape obtained by said aiding means.~~

2. (Currently Amended) An information processing device according to Claim 1, wherein the constraining shape is a plane and the apexes thereof are at positions inputted by the user or
the constraining shape is a plane passing through the positions inputted by the user ~~shape in~~
~~which a three-dimensional position in real space obtained by external instructions is configured~~
~~of an apex or a component plane.~~

3. (Currently Amended) An information processing device according to Claim 1, wherein said operating means performs at least one of the following operations in performing an
operation controlling ~~the following control operations of the~~ position and orientation of the
virtual object ~~can be made using said operating means:~~

a translation operation for causing translational movement of the virtual object based
~~on translating transformation following~~ the constraining shape; and

a rotation operation for rotating the virtual object ~~transformation~~ on an axis which is a
normal vector at a plane where the constraining shape and the virtual object come into contact.

4. (Currently Amended) An information processing device according to Claim 1, wherein said operating means performs the operation controlling the position and the orientation
of the virtual object in real time in accordance with the user's instructions ~~the virtual object is~~
~~subjected to three-dimensional transformation by control operations of said operating means;~~
~~such that the position of said operating means on a two-dimensional screen and the position of~~
~~the virtual object on a two-dimensional screen are synchronized.~~

5. (Currently Amended) An information processing method for aiding control operations relating to controlling the position and orientation of a virtual object positioned in three-dimensional space, said method comprising:

an image taking step of taking images in real space ~~a measurement step obtaining external parameters indicating the position and orientation of image-taking means in order to fixedly display the virtual object in a superimposed manner on~~ in real space;

a superimposing step of superimposing the virtual object with the taken image;

an inputting step of obtaining three dimensional position information of a plurality of positions inputted by a user in real space;

~~an operating step for controlling the position and orientation of the virtual object;~~

a setting an aiding step of setting for adding constraints to the control operations of an operating means so as to aid the control operations on the virtual object; an input step for inputting a constraining shape based on the obtained three dimensional position information to be a reference for generating the constraints; and

an operating a synthesizing step for performing an operation controlling the position and the orientation synthesizing pictures of real space obtained by image-taking means, and pictures of the virtual object based on the constraining shape in accordance with the user's instructions estimated from the position and orientation of the image-taking means, wherein the position and orientation of the virtual object in said operating step is transformed in said aiding step with the constraining shape as a reference, thereby aiding control operations.

6. (Currently Amended) An information processing method according to Claim 5, wherein said setting step sets a constraining shape comprising a plane the apexes thereof being at positions inputted by the user in said inputting step or sets a constraining shape comprising a plane passing through the positions inputted by the user in said inputting step ~~wherein said input step obtains three-dimensional position in real space from external instructions.~~

7. (Currently Amended) An information processing method according to Claim 6, wherein said operating step comprises the steps of:

causing translational movement of ~~translating~~ the virtual object based on the constraining shape; and

rotating the virtual object on an axis which is a normal vector at a plane where the constraining shape and the virtual object come into contact ~~wherein a virtual image indicating the input virtual shape is synthesized with an image of the real space and pictures of the virtual object.~~

8. (Original) A computer program, wherein the information processing method according to Claim 5 is executed by a computer device.

9. (Original) A computer-readable recording medium, storing the computer program according to Claim 8.

10. (Currently Amended) An information processing method for ~~controlling~~ changing the position and orientation of a virtual object in ~~compounded real~~ mixed reality space obtained by ~~combining synthesizing pictures of a~~ real image space and a virtual image object, said method comprising the steps of:

~~a step for~~ obtaining a constraining shape ~~serving as constraint conditions~~; from a plurality of positions in real space designated ~~instructed~~ by a user using an operating unit capable of obtaining three-dimensional positional information;

~~a step for~~ changing the position and orientation of the virtual object according to instructions from the user, ~~with~~ based on the obtained constraining shape as constraint conditions; and

~~a step for synthesizing~~ combining an image of the virtual object generated according to the changed position and orientation, ~~and the~~ with pictures of real image space.

11. (Currently Amended) An information processing method according to Claim 10, further comprising the step of combining ~~wherein~~ a virtual image indicating the constraining shape ~~input virtual shape is synthesized~~ with the pictures of real image space.

12. (Original) An information processing method according to Claim 10, wherein the constraining shape is a plane.

13. (Currently Amended) An information processing method according to Claim 10, wherein said changing step changing ~~change~~ of the position and orientation of the virtual object is carried out by changing the position and orientation of the operating unit.

14. (Original) A computer program, wherein the information processing method according to Claim 10 is executed by a computer device.

15. (Original) A computer-readable recording medium, storing the computer program according to Claim 14.

16. (Currently Amended) An information processing device for aiding control operations relating to controlling the position and orientation of a virtual object positioned in three-dimensional space, said device comprising:

an image-taking unit configured to take ~~for taking~~ images in real space in order to display the virtual object in a superimposed manner on real space;

a superimposing synthesizing unit configured to superimpose ~~for synthesizing a the~~ virtual object with the taken image;

an inputting unit configured to obtain three-dimensional position information of a plurality of positions inputted by a user in real space;

a setting unit configured to set a constraining shape based on the obtained three-dimensional position information; and

an operating unit configured to control ~~for controlling~~ the position and orientation of the virtual object based on the constraining shape in accordance with the user's instructions and an input unit for obtaining a three-dimensional position of real space from external instructions, and obtaining a constraining shape for aiding in controlling the position and orientation of the virtual object;

~~wherein the position and orientation of the virtual object are controlled by instructions from said operating unit, based on constraint conditions based on the constraining shape obtained by said input unit.~~

17. (Currently Amended) An information processing device according to Claim 16, wherein the constraining shape is a plane and the apexes thereof are at positions inputted by the user or the constraining shape is a plane passing through the positions inputted by the user ~~shape in which a three-dimensional position in real space obtained by external instructions is configured of an apex or a component plane.~~

18. (Currently Amended) An information processing device according to Claim 16, wherein said operating unit performs at least one of the following operations in performing an operation controlling the following control operations ~~of the position and orientation of the virtual object can be made using said operating unit:~~

a translation operation for causing translational movement of the virtual object based on transformation following the constraining shape; and

a rotation operation for rotating the virtual object ~~transformation~~ on an axis which is a normal vector at a plane where the constraining shape and the virtual object come into contact.

19. (Currently Amended) An information processing device according to Claim 16 †, wherein said operating unit performs the operation controlling the position and the orientation of the virtual object in real time in accordance with the user's instructions ~~the virtual object is subjected to three-dimensional transformation by control operations of said operating unit, such that the position of said operating unit on a two-dimensional screen and the position of the virtual object on a two-dimensional screen are synchronized.~~